Claims

1. A concentrator having a first surface, a second surface, and a concentrating surface disposed between the first surface and the second surface, the concentrating surface having a first profile which effects concentration of incident radiation at the first surface on to the second surface, and preferably, which is configured to discriminately collect incident radiation depending on polarisation such that incident radiation which reaches the second surface has a higher proportion of radiation that is plane polarised in a predetermined orientation than the radiation incident at the first surface.

2. A concentrator according to claim 1 which comprises a polarising filter preferably along an optical path which passes through the first and second surfaces.

3. A concentrator according to claim 2 wherein the polarising filter is adjacent and/or proximal the second surface.

4. A concentrator according to claim 3 wherein a polarising filter is adjacent the first surface and/or the first surface comprises a polarising filter.

5. A concentrator having a first surface, a second surface, and a concentrating surface disposed between the first surface and the second surface, the concentrating surface having a first profile which effects concentration of incident radiation at the first surface on to the second surface.

6. A concentrator according to any preceding claim wherein the first profile is designed such that only incident radiation having an angle of incidence within a predetermined acceptance angle is concentrated by the first profile to the second surface.

7. A concentrator according to any preceding claim comprising a second profile disposed between the first and second surfaces which second profile is shaped to concentrate less incident radiation than the first profile.

8. A concentrator according to claim 6 and claim 7 wherein the predetermined acceptance angle of the second profile is smaller than acceptance angle of the first profile.

9. A concentrator according to any preceding claim wherein the first surface has a major diameter/dimension and a minor diameter/dimension wherein the major diameter/dimension is longer than the minor diameter/dimension.

10. A concentrator according to claim 9 wherein the major and minor diameter/dimensions are substantially perpendicular.

11 A concentrator according to claim 9 or 10 wherein the major diameter/dimension is delimited by the first profile.

12. A concentrator according to claim 9, 10 or 11 when dependent on claim 7 or 8 wherein the minor diameter/dimension is delimited by the second profile.

13. A concentrator according to any preceding claim wherein the first surface is oval or elliptical.

14. A concentrator according to any preceding claim wherein the first surface is convex in at least one plane and preferably in the plane of the first profile.

15 A concentrator according to any preceding claim wherein the concentrating surface has a concavely curved portion and the first profile is in the concavely curved portion.

16. A concentrator according to any claim dependent on claim 7 wherein the concentrating surface has a substantially straight or flat portion and preferably the second profile is in the substantially straight or flat portion.

17. A concentrator according to any preceding claim wherein the first profile is designed to optimally totally internally reflect.

18. A concentrator according to any preceding claim wherein the first surface and/or the concentrator is rotationally asymmetric.

19 A concentrator according to any preceding claim wherein the first surface and/or the concentrator is symmetrical about a central plane.

20. A concentrator according to any of claims 7 to 18 when dependent on any of 3 to 5 wherein the polarising filter filters radiation polarised in the direction of the minor axis and/or perpendicular to a plane containing the first profile.

21. A concentrator according to any of claims wherein the cross section of the concentrator along the concentrating surface is rotationally asymmetric.

22 A concentrator according to any of claims wherein the cross section of the concentrator along the concentrating surface is oval or substantially rectangular.

23. A concentrator according to any preceding claim comprising a narrow band pass filter.

24. A concentrator according to any preceding claim having a body comprising an optically transmissive material, which body is delimited by the first, second and concentrating surfaces.

25. A concentrator according to any claim 24 wherein the material of the body is dyed to act as an optical filter.

26. A concentrator according to any preceding claim comprising an anti reflective coating on the second surface.

27. A communication receiver comprising a concentrator according to any preceding claim and a photodetector adjacent the second surface for detecting incident radiation which reaches the second surface and providing an output signal indicative of the radiation detected.

28. A communication transmitter comprising a concentrator according to any preceding claim and an emitter adjacent the second surface for emitting radiation from the second surface, the first profile effecting diffusion of emitted radiation from the second surface on to the first surface, and radiation being transmitted from the first surface.

29. A transmitter according to claim 28 which is configured to discriminately transmit emitted radiation depending on polarisation such that emitted radiation which leaves the first surface has a higher proportion of radiation that is plane polarised in a predetermined orientation than the radiation emitted by the emitter.

30. A transmitter according to claim 28 or 29 comprising a second profile disposed between the first and second surfaces which second profile is shaped to diffuse less emitted radiation than the first profile.

31. A communication system comprising a concentrator or receiver according to any of claims 1 to 27 and a radiation emitter wherein the concentrator/receiver receives radiation emitted from the emitter.

32. A communication system according to claim 31 wherein the radiation emitted by the emitter is polarised.

33. A communication system according to claim 32 wherein the radiation emitted by the emitter is polarised in the direction normal to the orientation filtered by the polarising filter and/or in the direction of the major diameter/dimension or plane containing the first profile.

34 A communication system according to claim 32 or 33 wherein the radiation emitted by the emitter is substantially coplanar with the major diameter/dimension or plane containing the first profile of the concentrator.

35. A communication system according to claim 33 or 34 comprising a second communication receiver orientated so that the polarising filter of the second receiver filters out the emitted radiation and wherein the signal from the second concentrator is subtracted from the signal from the first concentrator to remove ambient radiation from the combined signal.

36. A communication system according to any of claims 30 to 35 wherein the radiation emitter comprises/forms part of a radiation transmitter according to any of claims 27 to 29.

37. A communication system according to any of claims 30 to 36 wherein the emitted radiation is in the infrared spectrum.

38. An optical transceiver/device for a wireless communication system comprising an optically transmissive body having a first and second end and a reflecting surface disposed between the first and second end, which reflecting surface (totally internally) reflects radiation passing through the body onto the first or second end wherein an optical polarising filter is located between the first and second ends such that it polarises radiation that passes through the body.

39 An optical transceiver/device according to claim 38 in which the first end has a larger surface area than the second end and the reflecting surface is shaped such that radiation passing through the body from the second end to the first end is concentrated and radiation passing through the body from the first end to the second end is diffused.

40. A transceiver/device according to claim 38 or 39 in which the first end has a major diameter/dimension and a minor diameter/dimension wherein the major diameter/dimension is longer than the minor diameter/dimension and the angle of field is greater along the major diameter/dimension than along the minor diameter/dimension.